IV. "On some new Colouring Matters." By ARTHUR H. CHURCH and WILLIAM H. PERKIN. Communicated by A. W. HOFMANN, Ph.D., F.R.S. Received February 5, 1856.

Nascent hydrogen, acting upon an alcoholic solution of dinitrobenzole or of nitraniline, produces a crimson coloration, due to the formation of a new substance, to which we have given the name *nitrosophenyline*.

This new body presents some remarkable properties. It fuses below 100° C.; is uncrystallizable, and not volatile without decomposition; it dissolves in alcohol with an orange-red tint, and an alcoholic solution containing only ·2 per cent., although perfectly transparent to transmitted light, presents a flame-coloured luminous opacity in reflected light. Nitrosophenyline dissolves in hydrochloric acid, producing an intense crimson colour, which is changed to a yellowish-brown by alkalies and is restored by acids.

The analysis of nitrosophenyline has led us to the formula

$$C_{12}H_6N_2O_2,$$

which may be written thus:—$C_{12}\begin{matrix}H_6\\NO_2\end{matrix}N$, and so may be viewed as aniline, in which 1 equiv. of hydrogen is replaced by 1 equiv. of binoxide of nitrogen: the following equation sufficiently explains the formation of nitrosophenyline:—

$$C_{12}H_4 2NO_4 + 8H = C_{12}H_6N_2O_2 + 6HO.$$

We have produced from all the dinitro-compounds we have yet experimented upon, colouring matters similar to nitrosophenyline: the following is a list of such dinitro-compounds:—

1. Dinitrobenzole .... $C_{12}H_4 2NO_4$.
2. Dinitrotoluole..... $C_{14}H_6 2NO_4$.
3. Dinitroxylole..... $C_{16}H_8 2NO_4$.
4. Dinitroxylole..... $C_{18}H_{10} 2NO_4$.
5. Dinitrocymole..... $C_{20}H_{12} 2NO_4$.
6. Dinitronaphthaline.. $C_{20}H_6 2NO_4$.

We have examined minutely the colouring substance produced in

the case of dinitronaphthaline. It proves to be perfectly analogous in composition with nitrosophenyline; in properties also it is similar; and from its alcoholic solution it may be obtained in crystals, having a lustre somewhat similar to that of murexide: its formula, as deduced from our analysis, is

$$C_{20}\,H_8\,N_2\,O_2,$$

which we may arrange thus :—$C_{20}\overset{H_8}{NO_2}\,N$, and so view it as naphthylamine in which 1 equiv. of hydrogen has been replaced by 1 equiv. of binoxide of nitrogen. This substance we term nitrosonaphthyline. It may likewise be obtained by the action of nitrous acid on naphthylamine, or of nitrite of potassium upon the hydrochlorate of naphthylamine: the following equations represent the three processes for its formation :—

1. $C_{20}\,H_6\,2NO_4 + 8H = C_{20}\,H_8\,N_2\,O_2 + 6HO.$
2. $C_{20}\,H_9\,N + NO_3 = C_{20}\,H_8\,N_2\,O_2 + HO.$
3. $C_{20}\,H_{10}\,N,\,Cl + KNO_4 = C_{20}\,H_8\,N_2\,O_2 + 2HO + KCl.$

*February* 28, 1856.

The LORD WROTTESLEY, President, in the Chair.

The following communications were read :—

I. The following Letter was read, from Professor HANSTEEN of Christiania, For. Mem. R.S. :—

*To the Royal Society of London.*

As a Corresponding Member of the Royal Society, I have the honour herewith to transmit a Research "On the Secular Changes of the Magnetical System of the Earth, and more specially on the Secular Variation of the Magnetical Inclination in the Northern Temperate Zone," separately printed from the 'Memoirs of the Roy. Soc. of Sciences of Copenhagen.' By calculating newer and more ancient observations of the magnetical declination, I have ascertained the movement of the four magnetical polar regions, which I had